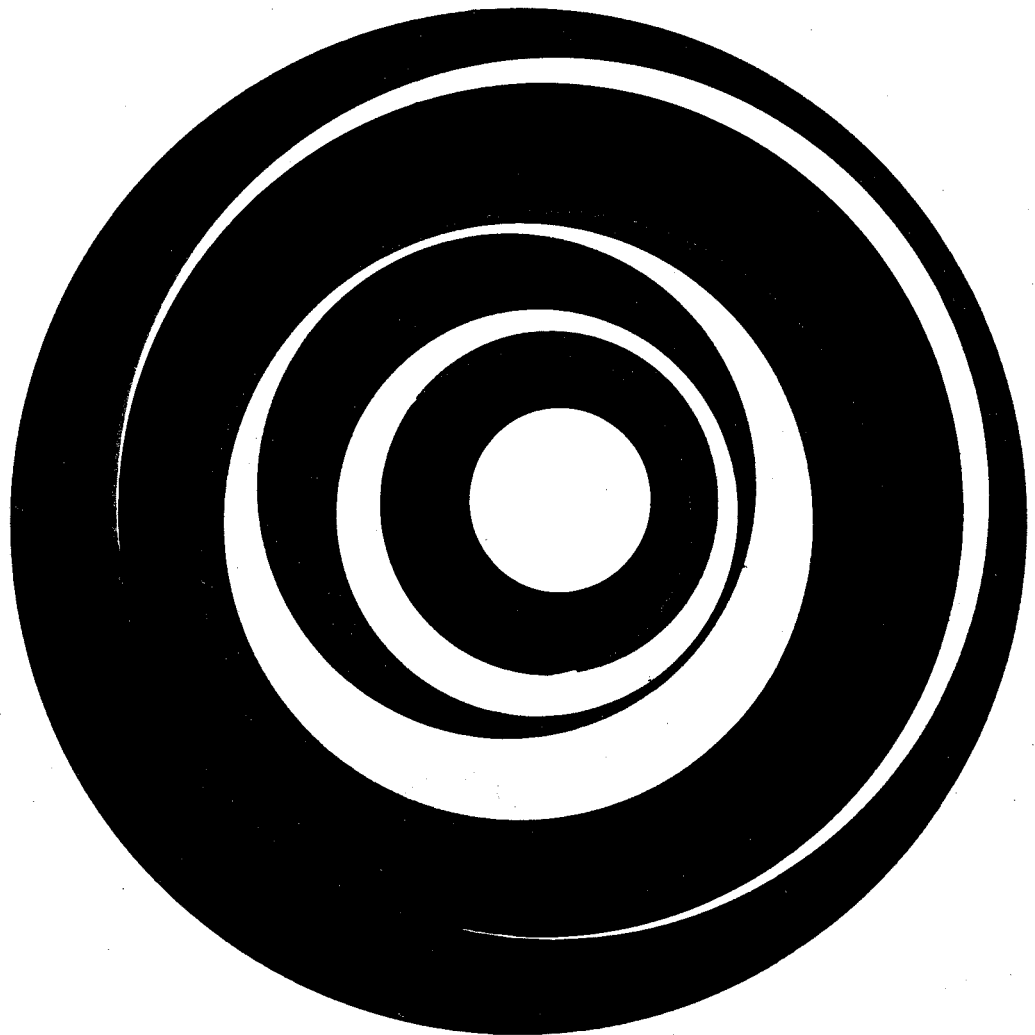




HITACHI
HI-FI COMPONENT

IA-1200

**INTEGRATED AMPLIFIER
INSTRUCTION MANUAL**



Hitachi, Ltd. Tokyo Japan

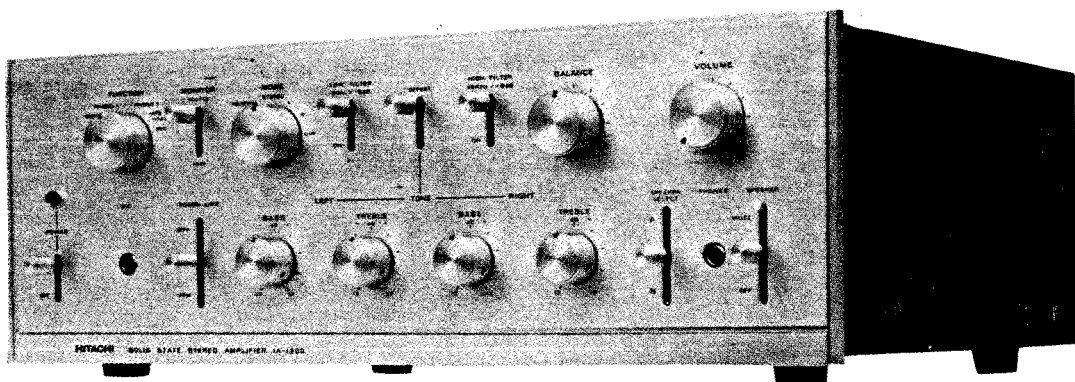
Thank you very much for purchasing HITACHI integrated amplifier IA-1200.

IA-1200 is a versatile, high performance amplifier designed for use by music lovers. It has four built-in main amplifiers, which makes it possible to use this equipment in three ways; as full range, multi-channel, and center woofer systems. For the heart of this equipment HITACHI silicon transistors of high reliability are used, which will please you with low distortion sound over a wide dynamic range. A variety of built-in accessory circuits are designed to suit every kind of program source in the best condition. Before using IA-1200, please read this instruction manual so that you can bring the performance of this equipment into full play.

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HITACHI, Ltd. has been devoting its effort to the development of a series of audio equipment and high class Hi-Fi components of high performance and low distortion. HITACHI has put this IA-1200 on the market with confidence.



● Before using

Be sure to turn off the power switch when you remove the cover in order to insert the filter unit or to operate the channel select.

Be sure that the ventilation holes on the amplifier cover are not blocked, and do not place this equipment in direct sunlight, because transistors are susceptible to heat and excessive heat causes troubles. Pay attention for efficient radiation of heat during use.

● Handling of Front Knobs

● Mode switch (MODE)

A five-position switch for different uses.

REVERSE

sound emitted from the left and right speakers is reversed.

STEREO

reproduction in normal stereo.

LEFT

signals from the left input terminal are reproduced by both left and right speakers.

RIGHT

signals from the right input terminal are reproduced by both left and right speakers.

L + R

left and right signals are reproduced by left and right speakers after being mixed. Reproduction of a monaural record at this position is accomplished with less noise.

● Function switch (FUNCTION)

For selection of program sources which you prefer.

● Monitor (MONITOR)

When reproducing sound using a tape deck, push this lever toward TAPE position. While recording sound on a three-head tape recorder, you can simultaneously monitor the recording condition by positioning this lever at TAPE.

● Power switch (POWER)

When this switch is pushed toward ON, the pilot lamp above it comes on and power is supplied.

● Microphone jack (MIC)

Sensitivity of 1.5 mV and flat characteristic.

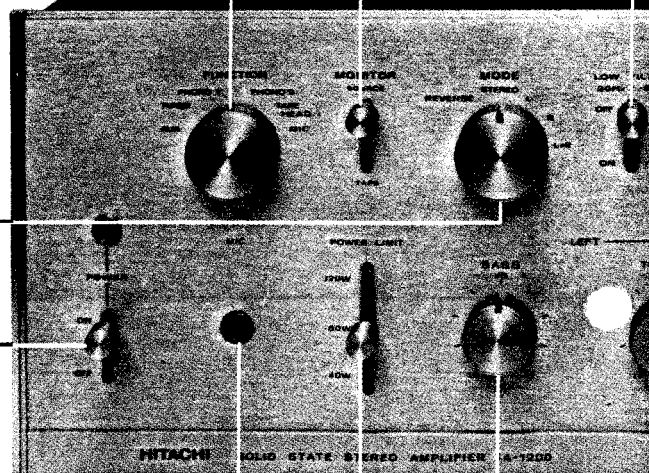
Usable for a microphone having an impedance less than 10 k Ω . Regardless of the position of the mode switch, the mode becomes L + R state when a microphone is plugged into this jack so that signals from one microphone are reproduced by both left and right speakers. This jack will facilitate commentary at a record concert and public-address use.

● Power limit (POWER LIMIT)

Position this lever according to the allowable speaker input. Usually, the allowable instantaneous speaker input is more than three times the allowable continuous input. The indication is the total value of all channels.

● Bass control (BASS)

Bass adjustment in a range of +12 dB at 100 Hz can be made for left and right speakers separately.



● **Low filter (LOW FILTER)**

When this switch is ON, rumble of a turntable, low frequency noise in a record, and low frequency noise due to a microphone are attenuated by 8 dB at 30 Hz. This switch functions regardless of the setting of the defeat switch.

● **Tone defeat (DEFEAT)**

When this lever is pushed down adjustment of treble and bass becomes possible, and when pushed up a flat characteristic is obtained regardless of the position of the control knobs.

● **Balance (BALANCE)**

This is for adjusting the left and right output levels. Adjust so that the volume of sound from the left and right speakers balances at the listening positions.

● **Volume (VOLUME)**

This is for adjusting the volume of sound.

● **High filter (HIGH FILTER)**

When this switch is ON, scratches from a used record and high frequency noise of AM broadcasting can be attenuated by 8 dB at 10 kHz. This switch functions regardless of the setting of the defeat switch.

● **Speaker switch (SPEAKER)**

While in use this switch is positioned at ON. When positioned at MUTE the output is decreased to 1/10 (10 dB). It is possible to decrease sound without decreasing the volume when a record is exchanged or when it is desired that the volume of sound be decreased temporarily. When positioned at OFF no sound is reproduced from the speakers. When a headphone is used, position this switch at OFF.

● **Headphone jack (PHONES)**

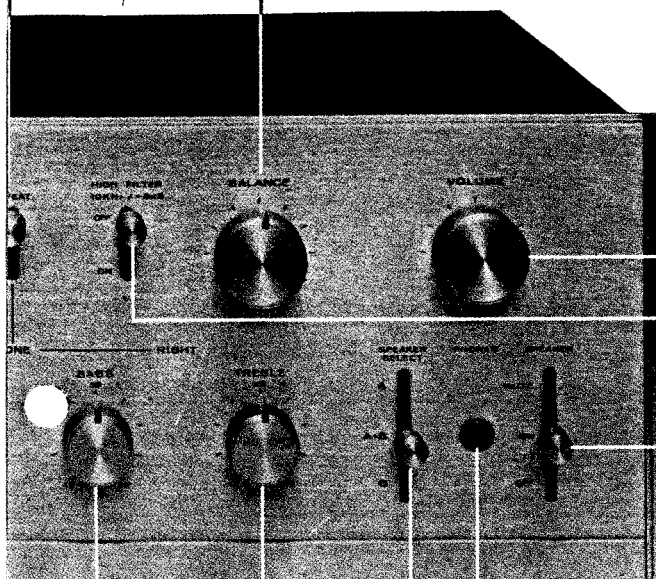
To this jack a headphone with an impedance of 8Ω can be connected. Because of a built-in amplifier for exclusive use with the headphone this jack can be used regardless of the main amplifier.

● **Treble control (TREBLE)**

Treble adjustment in a range of ± 12 dB at 10 kHz can be made for left and right speakers separately.

● **Speaker select (SPEAKER SELECT)**

This is an ON-OFF switch for two sets of the four built-in main amplifiers. For operation of this switch, refer to the section on connection of speakers.



● Connection of Rear Terminals

● Connecting jack for pre-amplifier and main amplifier

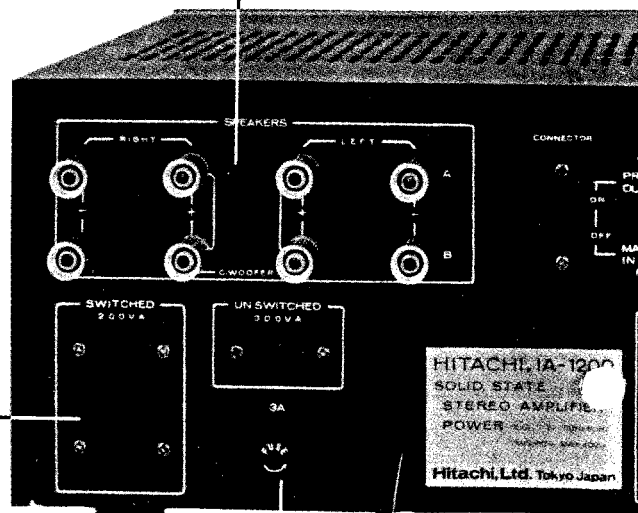
By the use of this jack the pre-amplifier and main amplifier can be used separately. This jack will facilitate increasing the number of channels of a multi-channel amplifier. Changeover is accomplished by CONNECTOR switch.

● Input and output jacks for tape deck

Connect a tape deck having a head output jack to TAPE HD jack (equalizer is NAB of 19 cm/s). Connect a tape deck having a built-in preamplifier to TAPE MONITOR jack for playback and to REC.OUT jack for recording. Con-

● Speaker terminal (SPEAKERS)

Different connecting methods are employed depending on uses. Refer to the section on connection of speakers.



● Power source socket (AC OUT-LET)

This supplies power to a tape recorder, record player, tuner, etc. The socket marked SWITCHED socket is independent of the power switch.

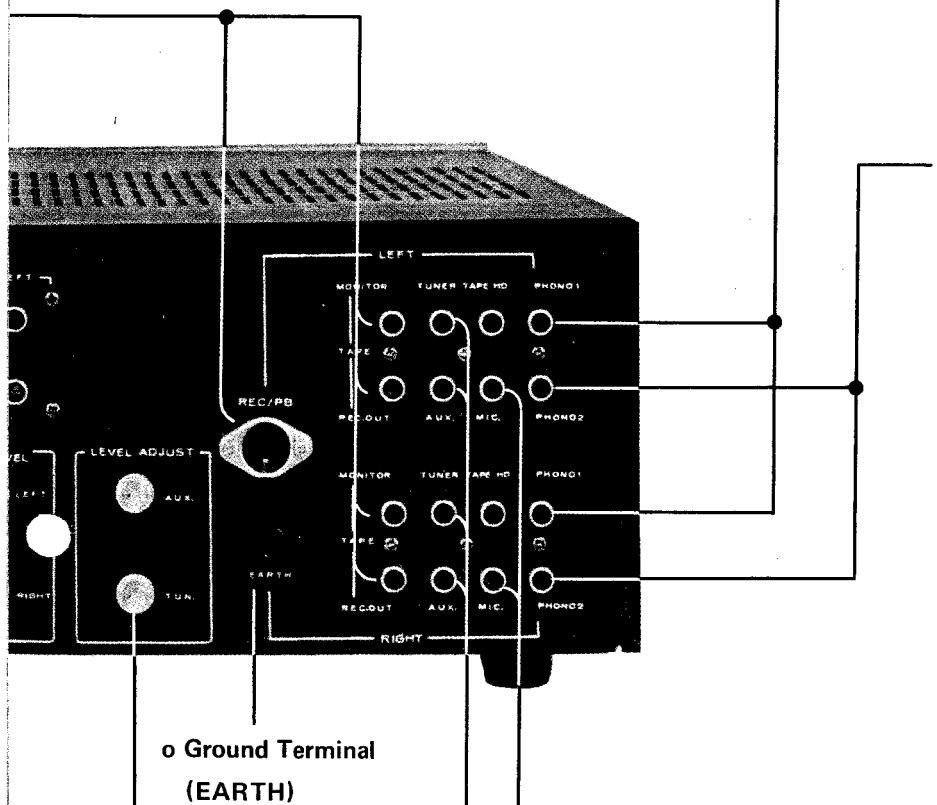
● Fuse holder 2A fuse is contained.

● Power cord

● Main A channel level (MAIN A CH LEVEL)

When using this equipment as a multi-channel or center woofer amplifier, adjust this knob so that the volume of treble is balanced with bass. Left and right channels can be adjusted independently.

nect a tape deck having a DIN jack to REC/PB socket, and recording and playback can be accomplished with a single cord. In this case do not use MONITOR jack or REC.OUT jack.



● PHONO 1.

Input sensitivity is 1.5 mV. Connect a record player having a cartridge with an output of 1 - 3 mV (cut level of 5 cm/s.)

● PHONO 2.

Input sensitivity is 5 mV. Connect a record player having a cartridge with an output of 3 - 10 mV (cut level of 5 cm/s.) Input impedance is 50 kΩ for both PHONO 1 and 2, and the equalizer is of RIAA standard.

● Level adjust (LEVEL ADJUST)

This matches the volume of AUX and TUNER with that of record playback. While recorded sound is being reproduced turn the function switch to AUX and TUNER positions without turning the volume knob and adjust the volume of sound.

● Tuner and auxiliary input terminals

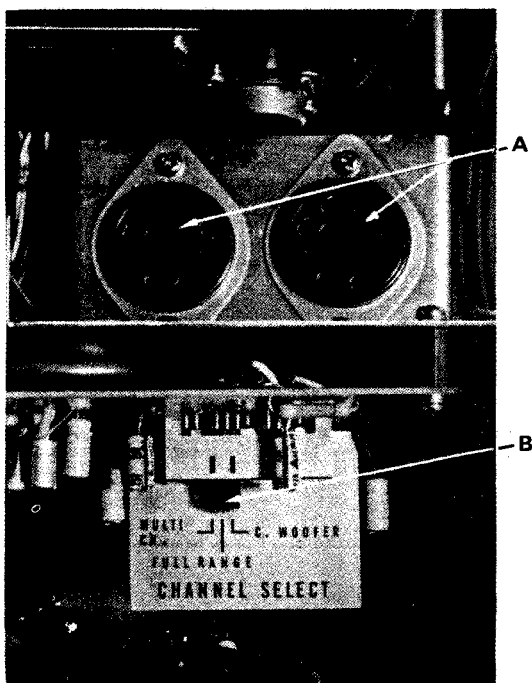
Input sensitivity is higher than 50 mV for both tuner and auxiliary input. Input impedance is higher than 100 kΩ. Frequency characteristic is flat. Adjust the input level by the level adjust knobs on this rear panel.

● Microphone jacks

Sensitivity is 1.5 mV and the characteristic is flat. A microphone with less than 10 kΩ impedance can be used. While the microphone jack on the front panel is in use this microphone jack cannot be used.

● Connection of speakers

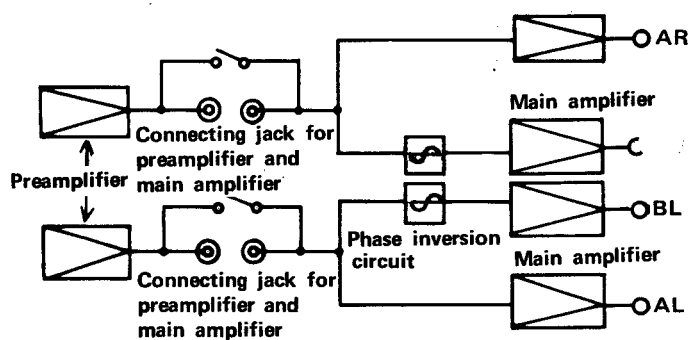
Several ways of speaker connection are possible with IA-1200 by turning the channel select switch. Be sure to connect speakers to the correct terminals. (Channel select switch will be found in the amplifier when the cover is removed. Before handling this switch be sure to turn off the power switch.)



A Socket for filter unit
B Channel select switch

● Full range connection

Block diagram for full range connection



● When one pair of speakers are used

In case two 30 W speakers are used. (30W x 2)
Connect to A channel or B channel and position the speaker select switch at A or B. Even if the unused channel is left open, electric shock or trouble will not be caused. (Fig. 1)

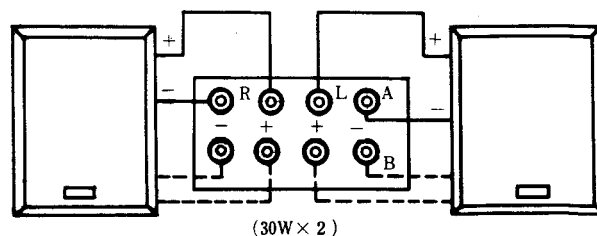


Fig. 1

In case two 60 W speakers are used. (60W x 2)
Connect to the respective plus terminals of A channel and B channel. When speakers with a low allowable input are connected, the maximum output can be limited by the power limit on the front panel. Position the speaker select switch at A + B. (Fig. 2)

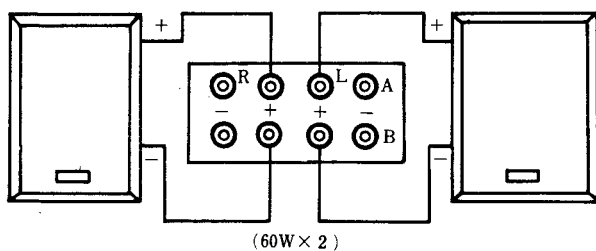


Fig. 2

● When two pairs of speakers are used.

In case four 30 W speakers are used. (30 W x 4)
Channels are switched by the speaker select switch on the front panel to A channel alone or B channel alone or A + B channels. Only when two pairs of speakers are used connect the speakers of B channel reverse polarity. (Since the phase inversion circuit is inserted in B channel, it is necessary to reverse the polarity of B channel to conform the phase of B channel to that of A channel when both A and B channels are used in the same room.) (Fig.3)

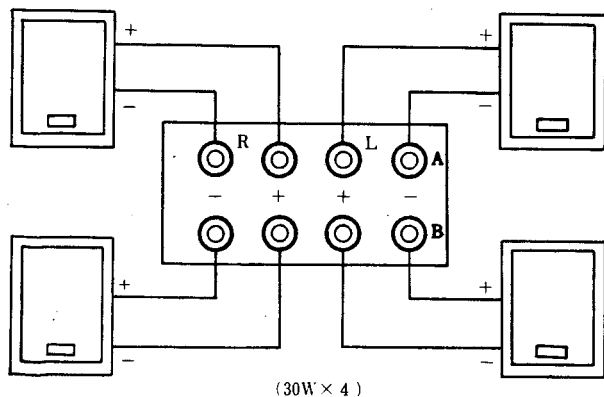
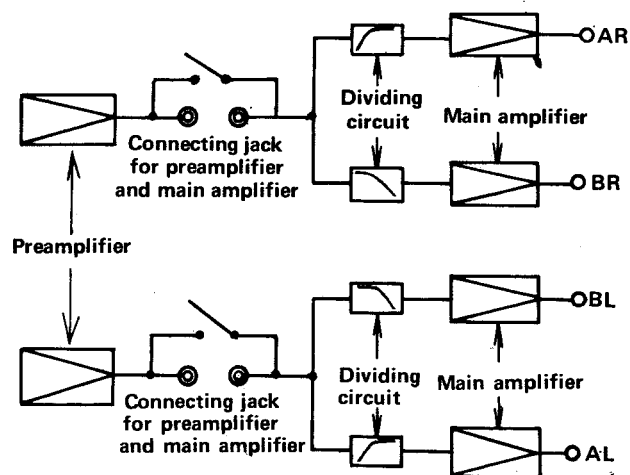


Fig. 3

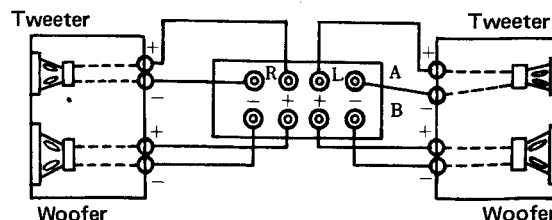
● In case of 2-way multi-channel.

Set the channel select switch in the equipment at the position of multi-channel. Then insert two commercially available filter units (one each for left and right channels) in the filter unit sockets. (Be sure to turn off the power switch, otherwise the units might be damaged by shock due to insertion.)

● Block diagram for multi-channel

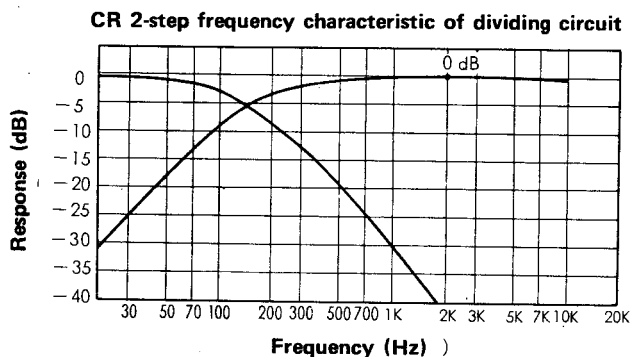


Connect speakers to the amplifier in such a way that the plus poles of speakers are connected to the plus terminals of the amplifier, and minus poles to minus terminals. A channel is for treble range and B channel for bass range. Adjust the level of the tweeter by MAIN A CH LEVEL knob. Turn it fully counterclockwise at first, then turn it clockwise little by little while listening to bass from the woofer.

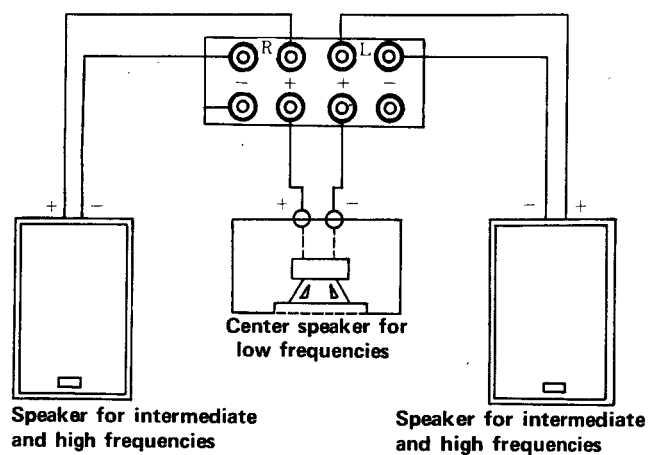


● In case of center woofer

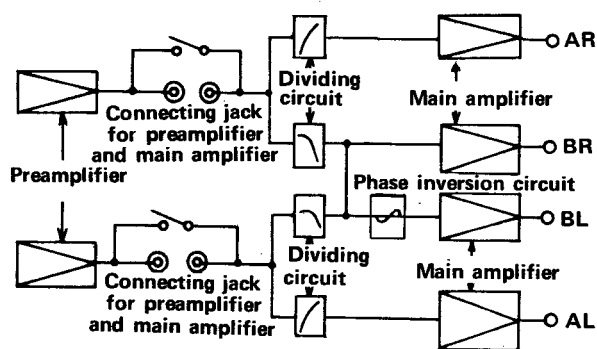
Set the channel select switch in the equipment at the position of C. WOOFER. A filter unit for center woofer is inserted in the filter unit socket. The crossover frequency is 150 Hz and its characteristic is shown below.



As a speaker system for intermediate and high frequencies, use speakers of small size, full range type. Adjust the level of speakers for intermediate and high frequencies by A CH LEVEL knob as in the case of multi-channel system. Connect a woofer as shown below.



o Block diagram for center woofer system



● Caustions during Use

● Make complete connection

Use perfect lead wires for connection of input terminals. Incomplete connection causes noise and prevents obtaining the maximum performance. Since the method of connecting speaker terminals is different from that of other equipment, make certain that connection has been made correctly before turning on the power switch.

The polarity of speakers can be confirmed by checking the phase with the mode switch turned to R + L position (monaural) of when a monaural record is played. Usually, if wrong polarity connected it will seem as if bass were decreased.

● Protective circuit

When power is cut off by the operation of the power limit and power transistor protective circuit (when speaker terminals are shorted or a speaker with very low impedance is actuated by excessive output), turn off the power switch and remove the cause,

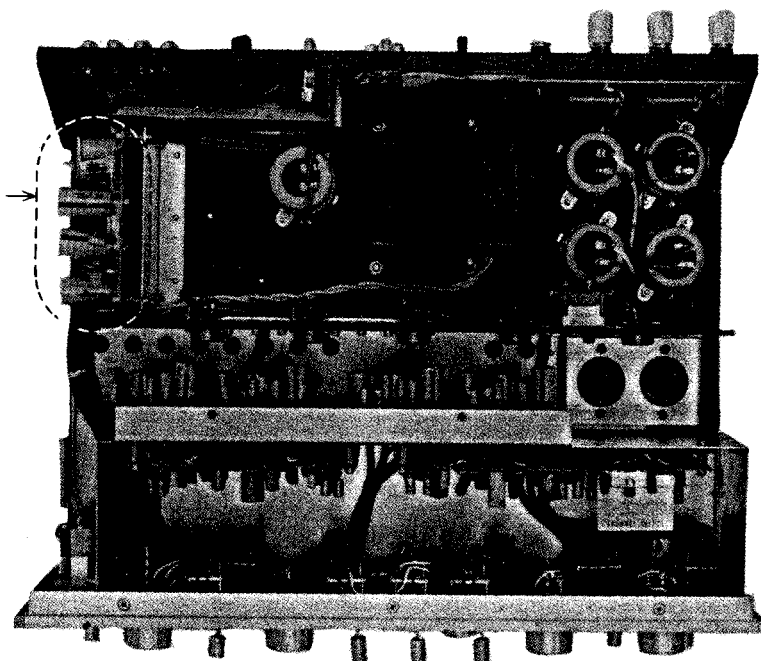
and then turn on the switch. Because of the built-in automatic release circuit, releasing is accomplished automatically even if the power switch is not turned off, but the protective circuit temporarily stops the operation of the amplifier.

While the protective circuit is operating the pre-amplifier is working.

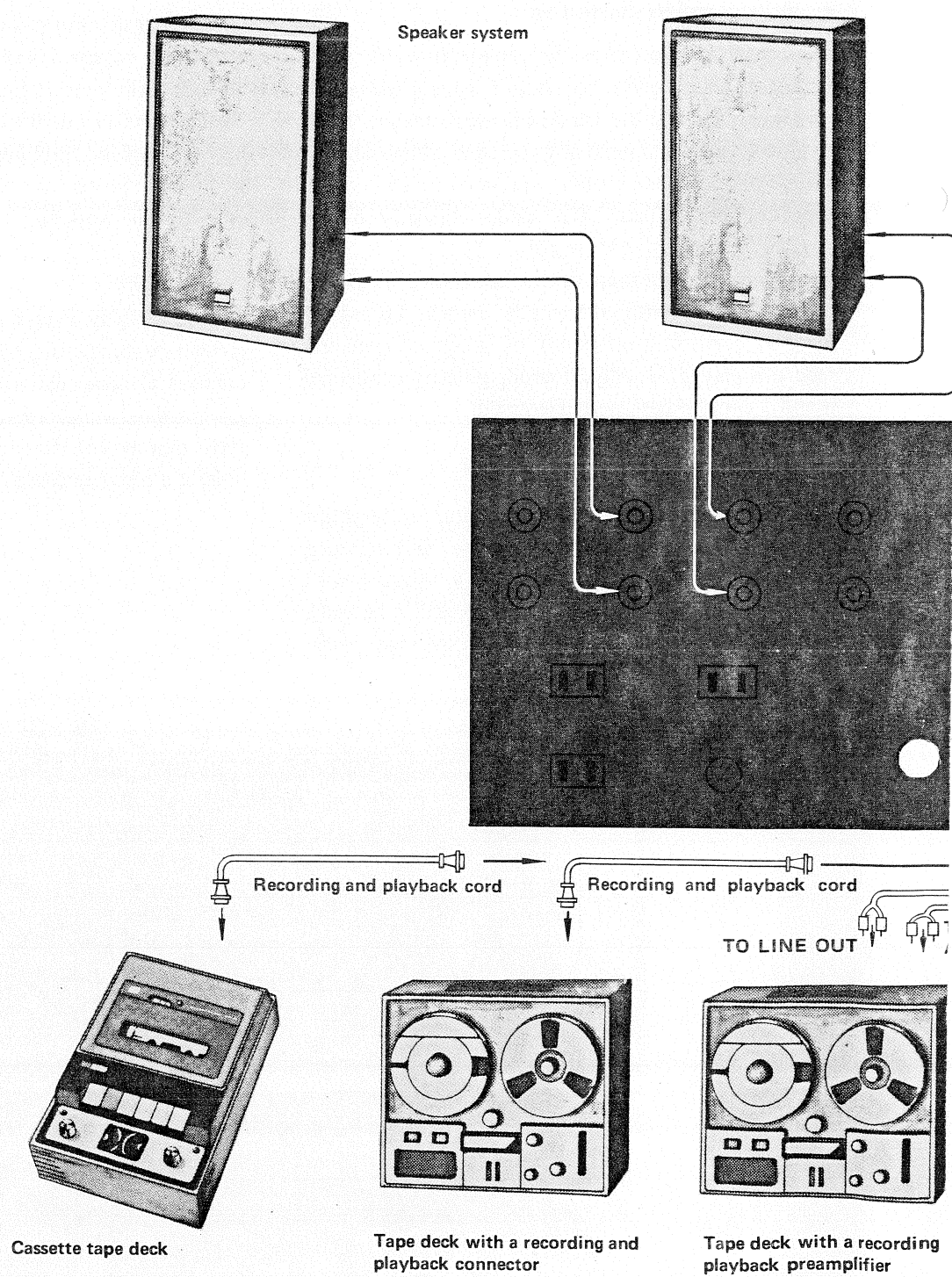
● Grounding

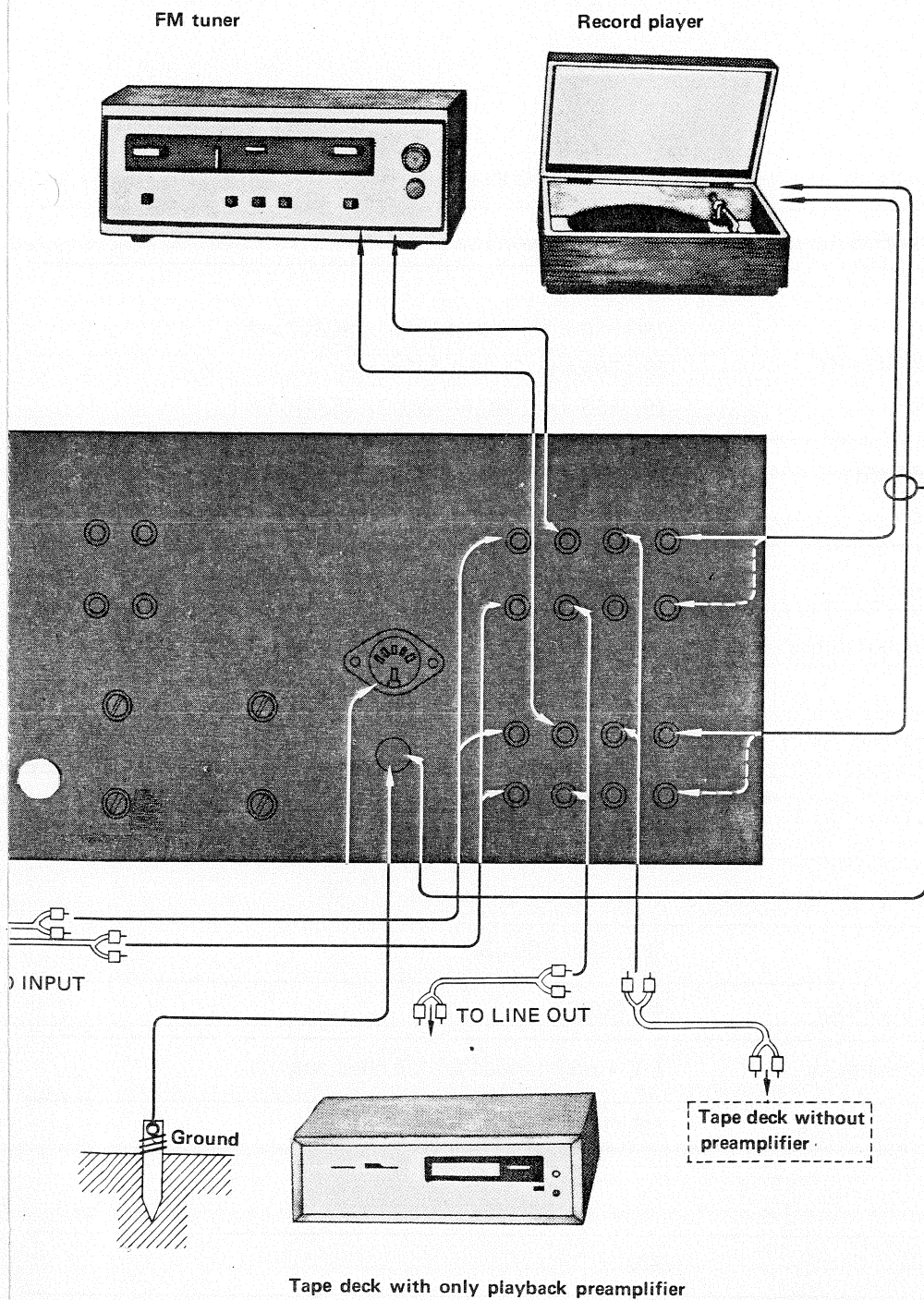
Connect a vinyl-coated wire or enamel wire to the ground terminal, and to the other end of this wire connect a copper plate to be buried in the ground. A ground wire for a player used together with this equipment may be connected to ground terminal; hum and noise are thus decreased.

Constant Supply and protective circuits



● Example of Construction of Stereo System





● Specifications

Type	All silicon transistor stereo integrated amplifier
Circuit system	Semi-complementary SEPP OTL
Transistors used	57 transistors 2SC-650 x 22, 2SC281 x 6, 2SC317 x 2, 2SC-708A x 12, 2SA-537A x 4, 2SC-655 x 8, 2SC-685A x 2, 2SA-565 x 1
Diodes used	17 diodes IN34A x 4, VO1G x 4, HV-23 x 8, ZR-212E x 1

● Main amplifier

Continuous output	120 W (8Ω) 30 W x 4, 60W x 2, 30 W - 60 W - 30 W (changeover)
Music power (IHF)	200 W
Distortion (T.H.D.)	Less than 0.1% at the rated output Less than 0.1% at 0.5 W output
Frequency characteristic	20 Hz - 50 kHz less than $\begin{smallmatrix} +0 \\ -1 \end{smallmatrix}$ dB
S/N	More than 100 dB
Damping factor	40 (8Ω)
Input sensitivity	1 V (input needed for the rated output)
Input impedance	50kΩ

● Preamplifier

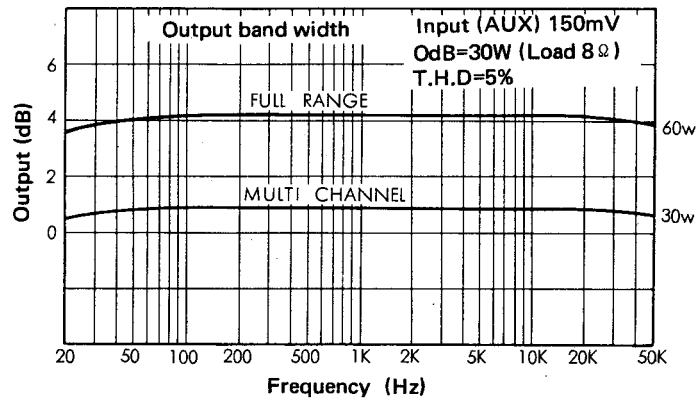
Output	3 V
Output impedance	10 kΩ
Distortion	Less than 0.1%

Specifications are subject to change for improvement without notice.

Input level (Input impedance)	PHONO 1	1.5mV (50 kΩ)
	PHONO 2	5mV (50 kΩ)
	TAPE HEAD	1.5mV (higher than 100 kΩ 1kHz) (higher than 300 kΩ 10 kHz)
	MIC	1.5mV (10 kΩ)
	TUNER, AUX	150mV (100kΩ)
	(adjustment in a range of 50 - 500mV is possible using level set)	
	TAPE MONITOR	300mV ± 2 dB
Output level (Output impedance)	Higher than 1 V (at standard input level)	
	Higher than 3 V (maximum) (less than 10 kΩ)	
	REC OUT (at standard input level)	200 mV ± 2 dB (less than 10 kΩ)
	DIN OUT (at standard input level)	50 mV ± 2 dB (less than 10 kΩ)
Tone control (with defeat switch)	BASS	100 Hz ± 12 dB (1 kHz 0dB)
	TREBLE	10 kHz ± 12 dB (1 kHz 0dB)
Filter	HIGH	10 kHz-8 dB
	LOW	30 Hz-8 dB
	3D	150 Hz (12 dB/Oct)
S/N (IHF)	PHONO 1, PHONO 2	90 dB
	TAPE HEAD, MIC	80 dB
	AUX, TUNER	100 dB
Power source		
Power consumption	220V, 50/60Hz	
	60 VA at no signal	
	400 VA at rated output	
Dimensions		
Weight	420 (W) x 140 (H) x 320 (D) mm	
	(16 $\frac{1}{2}$) (5 $\frac{1}{2}$) (12 $\frac{1}{2}$)	
	12 kg (26 lbs)	

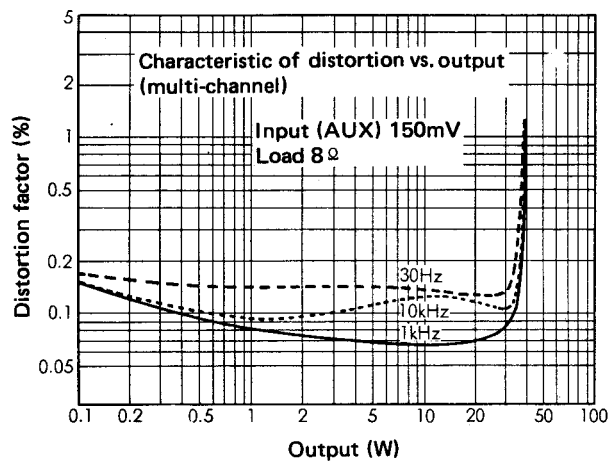
● Characteristic

Output band width



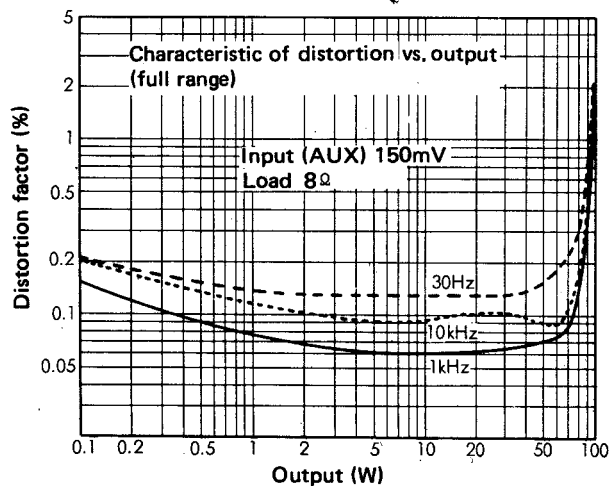
Input(AUX) 150mV
Load 8Ω

Characteristic of distortion vs. output
(multi-channel)



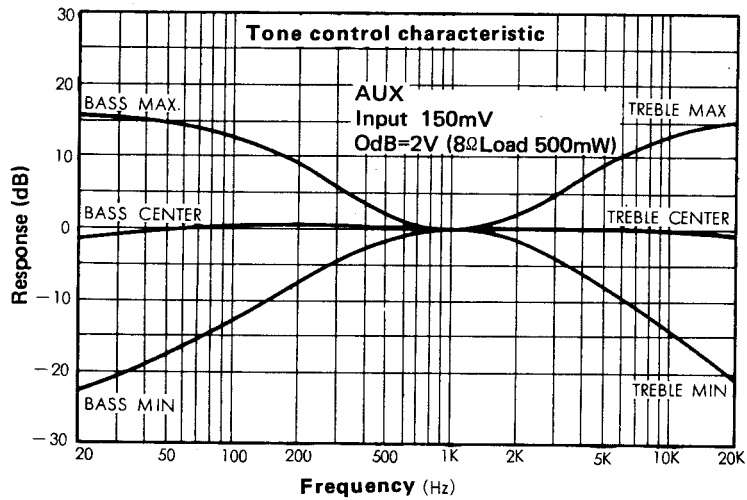
Input (AUX) 150mV
Load 8Ω

Characteristic of distortion vs. output
(full range)



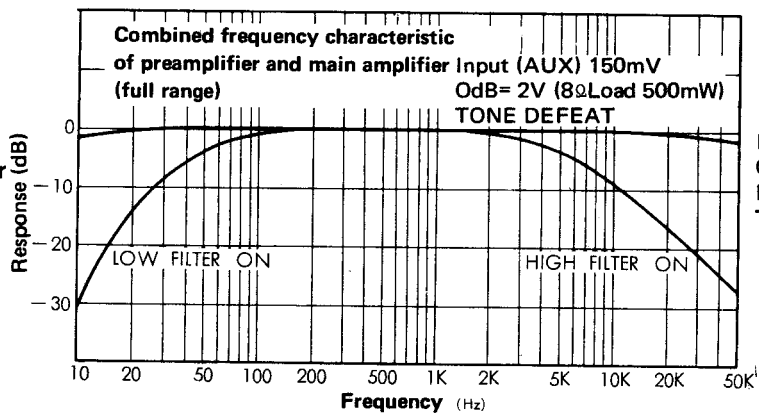
Input (AUX) 150mV
OdB= 30w (Load 8Ω)
Higher harmonic distortion
factor 5%

Tone control characteristic



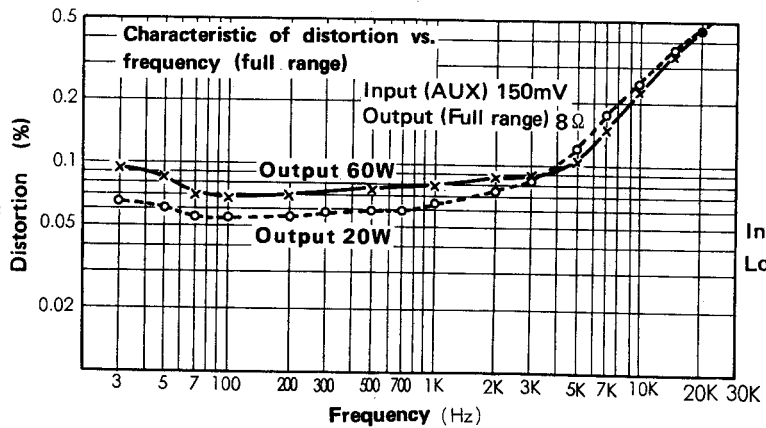
Input (AUX) 150mV
 OdB= 2V
 Load 8Ω

Combined frequency characteristic of preamplifier and main amplifier (full range)



Input (AUX) 150mV
 OdB= 2V
 Load 8Ω
 TONE DEFEAT

Characteristic of distortion vs. frequency (full range)



Input (AUX) 150mV
 Load 8Ω

IA-1200 CIRCUIT DIAGRAM

